



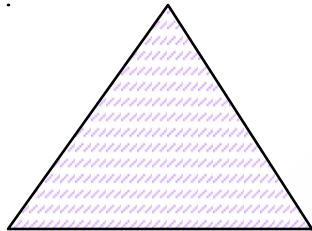
SPI, CMM, SMS Review

- 1. What is Software Process Improvement (SPI)?**
- 2. What is the Capability Maturity Model (CMM)?**
- 3. How many maturity levels are there in the CMM?**
- 4. What KPAs are in level 2?**
- 5. In which KPA does testing reside?**
- 6. What is the System Modification Scenario (SMS)?**
- 7. What are the levels of the SMS?**

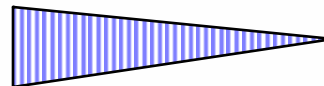


Test Case Exercise

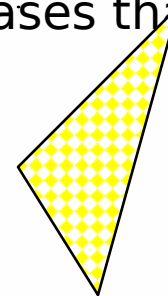
- Consider testing the following program:
 - The program reads three integer values from a card. The three values are interpreted as representing the lengths of the sides of a triangle. The program prints a message that states whether the triangle is scalene, isosceles, or equilateral.
 - On the next sheet, write a set of test cases that you feel adequately test this program.



Equilateral



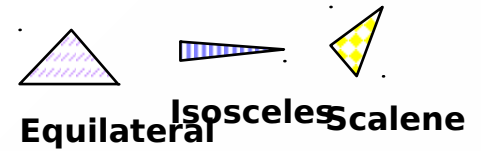
Isosceles



Scalene



Test Case Exercise



- e.g., - (2, 5, 3) a test case that represents a valid scalene triangle



TESTING INTRODUCTION

1. List some mandatory tests.
2. List some of the optional tests?
3. What testing levels are the responsibility of the FSA to perform?
4. What are the two basic strategies used in testing software ?
5. What is the different between “Glass/White Box” and “Black Box” testing ?
- ~~6. What are some of the characteristics of a Unit Test?~~



UT Infrastructure Modification

- Divide into teams.
- Read the description of the model system on the next page.
- Read the related SCR, X0101-00 on the page following the model system description.
- Use the SMS section on UT Infrastructure Modifications as your process.
- Prepare a Unit Test Structural Blueprint Definition and a Test Time Dimension Determination for the system. Use the blank form that follows the SCR.
- Present the team's results.



MODEL SYSTEM

The Asbury Company is a small Welding enterprise. It maintains a payroll file on a mainframe computer. The purpose of the file is to maintain current personal and payroll information on all 500 of their employees.

The current payroll MASTER file is called PAYDATA. It is an INDEX SEQUENTIAL FLAT file. There are multiple FIXED LENGTH records of 80 CHARACTERS. The records exist in numeric order. The Social Security Number is the INDEX KEY.

The PERSREC is the 01 record and it contains the employee personal data. Currently it has seven fields. The order of the fields and the data class is as follows: Record Number = 2 NUMERIC CHARACTERS, Social Security Number = 9 NUMERIC CHARACTERS, Name = 20 ALPHANUMERIC CHARACTERS; Address = 20 ALPHANUMERIC CHARACTERS; City = 16 ALPHANUMERIC CHARACTERS; State = 2 ALPHABETIC CHARACTERS; and Zip = 5 NUMERIC CHARACTERS. There are SPACES = 6 ALPHANUMERIC CHARACTERS at the end.

The PAYREC is the 02 record and it contains payroll data. Currently it has 5 fields. The order of the fields and the data class is as follows: Record Number = 2 NUMERIC CHARACTERS; Social Security Number = 9 NUMERIC CHARACTERS; Name = 20 ALPHANUMERIC CHARACTERS; Gross Pay = 12 NUMERIC CHARACTERS; and Net Pay = 12 NUMERIC CHARACTERS. There are SPACES = 25 ALPHANUMERIC CHARACTERS at the end..

The master file update is executed on daily, weekly and monthly cycles. Input can be received interactively or batched.



Defense Finance and Accounting Service System Change Request				
1. DFAS SCR# X0101-00		2. SCR# X0101-00		3. FROM:
4. SCR Title: VACATION EARNED	5. Total System Changes: 1		6. System: PAYROLL & ACCOUNTING 7. Subsystem: PAYREC RECORD	8. Category: SECRET 9. Date Received: 10 MAY 1995
10. Point of Contact: DEBBIE SMITH		11. Phone: (317) 543-1234		12. Office Code: DFAS-
<p>13. DESCRIPTION: Add vacation time earned to the PAYREC record. Initialize by zero filling the field. Cumulate the time each pay period. This field will show the actual number of hours earned. Produce two reports: ① Employee Vacation Hours Earned List - to show all vacation hours earned for each employee and number of days on the payroll. Page break at each employee's SSN to give the employee a copy each month. The break gives the employee privacy relating to their own vacation time. ② Employee Vacation Hours Taken List - to show employees' names, vacation hours available, and number of hours taken this calendar year to date</p> <p>14. RECOMMENDED SOLUTION: Add start date to PERSREC using next six spaces available. Calculate vacation time hours to the PAYREC record using the next six available spaces.. The calculations for vacation time will be as follows: 1 - 90 days 4 hours 121 - 270 days 12 hours 91 - 120 days 8 hours 270 - 365 days 16 hours Every 90 days over 365 days, the employee earns 36 hours. For example if an employee has worked 5 years and 20 days the employee would have earned 164 hours of vacation time if the employee had not used any leave.</p> <p>15. REQUESTER BENEFITS: To provide accurate vacation time hours available to the employee and the employee's manager .</p> <p>16. FUNCTIONAL / TECHNICAL ANALYSIS: For start date, use next six available characters at end of the PERSREC (01) record. For vacation hours earned, Use the next six available characters at the end of the PAYREC (02) record. For vacation hours taken, use the next six available characters at the end of the PAYREC(02) record.</p> <p>17. COST / BENEFIT ANALYSIS: By adding vacation time earned to the PAYREC record, it allows for better scheduling of vacation time without jeopardizing the overall mission.</p>				
18. Required by Date:		19. Work		20. CDA:
				21. DPI:



UT INFRASTRUCTURE MODIFICATION

UNIT TEST Structural Blueprint

Date: _____

Release #: _____

Master File Name: _____ Security: _____

Master File Structure: _____

Record Name: _____

Generate a Record Layout sheet: (A = Alpha, X = Alphanumeric, N = Numeric)

Test Time Dimensions: _____



Unit Test Scripts Modification Task

- Use the Model System Information.
- Use the SMS section on Unit Test Scripts Modification.
- Create a Unit Test Script for a case of your choosing that relates to the Model System. A sample Unit Test Script is on the following three pages.
- Include:
 - Test Case Category, Narrative Description, and Input Transaction Definition
 - Expected Output and Results
 - For the five definitions on UT script page 2 of 3, select only one and fully define according to the SMS
 - Setup, Execution, and Evaluation Instructions

UNIT TEST (UT) SCRIPTS MODIFICATION TASK



UNIT TEST SCRIPT

Page 1 of 3

Date: _____

Script ID (Program Name): _____

Narrative Description: _____

Input Transaction Definition: _____

Expected Results

Screen:

File Names:

Report ID:

Required File Records: _____

UNIT TEST (UT) SCRIPTS MODIFICATION TASK



UNIT TEST SCRIPT CON'T

Page 2 of 3

Identify Applicable Definition

Standard Unit Test Screen Format

Definition:

Standard Unit Test Inquiry Test Definition:

Standard Unit Test Outputs & Updates Test Definition:

Standard Unit Test Report Test Definition:

Standard Unit Test Transaction Input Test Definition:

UNIT TEST (UT) SCRIPTS MODIFICATION TASK



UNIT TEST SCRIPT CON'T

Page 3 of 3

Setup Instructions:

Execution Instruction Development:

Evaluation Instruction Development:



UT DATA MODIFICATION TASK

1. How can a test tool be beneficial?
2. Can test data be created without a tool?
3. Name some test tools you could use for this task.



UNIT TEST FINALIZATION TASK

- Individually, use the Model System and the SMS.
- Read SCR X0102-00 on the following page.
- Review and describe how you would modify the following documents created by you earlier today. A page is included for you to record your answers:
 - Test Infrastructure
 - Test Scripts
 - Test Data



Defense Finance and Accounting Service System Change Request				
1. DFAS SCR# X0102-00		2. SCR# X0102-00		3. FROM:
4. SCR Title: VACATION EARNED	5. Total System Changes: 1	6. System: PAYROLL & ACCOUNTING 7. Subsystem: PAYREC RECORD	8. Category: SECRET	9. Date Received: 10 MAY 1995
10. Point of Contact: DEBBIE SMITH		11. Phone: (317) 543-1234	12. Office Code: DFAS-	
13. DESCRIPTION: Allow each employee the capability to look at their own PAYREC data. This involves adding a password on their personal computer. This data should be made available using the Local Area Network (LAN) System. This information will be available to look at only. No changes will be allowed by the individual employee. Any errors will need to be corrected by the payroll personnel.				
14. RECOMMENDED SOLUTION: Using the employee's network ID and a password of their own choosing, the system will automatically show the employee's valid PAYREC data menu. Select the menu desired. The information then will display on the screen and be available for screen printing. Cumulate the fields, by pay periods. Add a field to the PAYREC record to show the actual number of days worked. GUI application has to be designed. The system will be available for use on the LAN and a menu designed				
15. REQUESTER BENEFITS: All employees will have available their PAYREC data to better schedule their vacation leave and adjust their work schedules accordingly.				
16. FUNCTIONAL / TECHNICAL ANALYSIS: Use the next six available characters at the end of the PAYREC (02) record, for the number of days worked.				
17. COST / BENEFIT ANALYSIS: By allowing each employee to have access, it will save the office money and time. Instead of printing the reports each pay period. The employee can print or see their report at a time convenient for him/her. It may not be necessary for an employee to see his/her report every pay period.				
18. Required by Date:		19. Work		20. CDA:
				21. DPI:

Created: 06/10/97 3:00 PM
File: D:\scrs\01\02\DFAS\DFAS.DOC

Updated: 06/10/97 3:00 PM
Page: 2 of 1



Unit Test Finalization Task

- How would you modify the:
 - Test Infrastructure
 - Test Scripts
 - Test Data



TESTBED DATA INITIALIZATION TASK

- Break into small groups and create answers to the following questions:
 - What steps would you take to determine the appropriate save point?
- What steps would you take to load your testbed at an appropriate test point?



UT RESOURCE MODIFICATION TASK

- Break into small groups and create answers to the following questions:
 - Where do your JCL/ECL or automated test scripts reside to control your test?
 - Where would you document the JCL/ECL to ensure availability for the test?



UNIT TEST (UT) EXECUTION TASK

- Break into groups and create answers to the following questions:
 - What steps would you take to execute the setup instructions?
 - What steps would you take to execute the test?
 - What types of additional output would you use to evaluate the results of a test?



UNIT TEST EVALUATION TASK

UNIT TEST SCRIPT CERTIFICATION

Date: _____

Script ID (Program Name): _____ Script Version: _____

<u>Release #</u>	<u>Date</u>	<u>Test Analyst</u>	<u>Cert. Date</u>	<u># of Iterations</u> <u>before Certification</u>
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COMMENTS: